HOW TO MAKE AGROFORESTRY SYSTEMS PAY OFF? USING ITS VALUES TO CREATE ECONOMIC DEVELOPMENT PATHWAYS

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Abstract

This uncertainty about the profitability of agroforestry systems is considered one of the main barriers preventing futher adoption by farmers. Therefore, in this study, we brainstormed about different schemes, mechanisms and arrangements that could onvert the benefits and values of agroforestry into direct economic incentives for farmers. Throughout three focus groups a range of different mechanisms were indentified, which were classified in three different groups: government schemes, market schemes and community-based schemes. In Flanders, currently only some of the mechanisms, mainly government mechanisms are put in place. However, some of the mechanisms could represent new economic pathways that reinforce the impact of the already existing mechanisms. Further development and tailoring of these different economic pathways can therefore help to turn AF into a more solid economic investment for farmers.

Keywords: community cooperatives; economic instruments; government incentive schemes; market mechanisms; public policy; temperate agroforestry systems

Introduction

Agroforestry (AF) is increasingly considered as a sustainable agricultural innovation which can address social, ecological, and biodiversity problems in industrialized agricultural regions. Although it has been shown that with careful design and management the overall productivity in AF systems can exceed those of conventional systems (Smith et al. 2012) this is not always translated into economic and financial benefits for the farmer (Palma et al. 2007; Van Vooren et al. 2016). On the one hand, this a result of the long duration between investment costs and pay-off, which greatly exceeds the usual planning horizon of traditional farming systems. Indeed, depending of the desired output of the AF system (wood versus fruits/nuts), it takes up to decades before harvesting can take place. Consequently, the farmer is confronted with a lot of risk and uncertainty. On the other hand the apparent lack of profitability is a result of the way in which agricultural markets function, only allowing for the valorization of productive services. For the many forms of societal value created by AF systems, e.g. biodiversity and landscape values, no compensation towards the farmer is available (Borremans et al. 2018).

Taking this into account, it is no surprise that Flemish farmers consider the uncertainty about the profitability of the farming system to be one of the main barriers to AF adoption (Borremans et al. 2016a). The subsidy program, initiated in 2011 and covering 80% of the plantation costs, may have brought some, already interested farmers on board. However, an agricultural innovation system analysis (Borremans et al. 2018; 2016b) has shown that other mechanisms have to be put in place to scale-up AF beyond its pioneering phase. Therefore, in this study, we brainstormed about different schemes, mechanisms and arrangements - traditional or very innovative and outside the box – that convert the benefits or values of AF into direct economic incentives for farmers. The aim of this study was to classify and analyze these different

mechanisms, and to give recommendations which respect to the best economic and policy pathways to further advance AF development in Flanders.

Materials and methods

Ideas were gathered during three focus groups, organized as part of three conferences: (1) the Transdisciplinary Agroecology Meeting (November 2015 in Leuven, Belgium), (2) the North American Agroforestry Conference (July 2017 in Virginia, US), (3) and the Belgian Agroecology meeting (November 2017 in Gembloux, Belgium). About 55 people attended the focus groups, including scientists, representatives of civil society organizations (e.g. NGO's), students and farmers, however, no farmers attended the last focus group. The structure of the three focus groups was similar: they started with a short introduction of the goal, were followed by a brainstorming session in smaller groups of 4 up to 6 people, and were concluded with a larger group discussion. In the first two focus groups, the brainstorming session was organized according to the '6-3-5 brainwriting' method (Heslin, 2009; Wodehouse and Ion, 2012). This method is an idea generation technique in which participants brainstorm in silence, i.e. participants get five minutes to write down three ideas in a concise way, after which pages are passed on to the next person in the group, who reacts to the idea, e.g. by giving recommendations, formulating requirements or giving examples. In the third focus group, participants discussed their ideas in the small groups to save time for the larger group discussion. After the brainstorming session, the small groups presented their top ideas to the rest of the group, which were arranged on the blackboard according to different themes. The focus groups concluded with a large group discussion on the (dis)advantages, feasibility and the impact of different categories of proposals. After the focus groups, the different mechanisms and arrangements were allocated to different categories of incentives, which were used to formulate policy recommendation to advance AF development in Flanders.

Results and discussion

Three categories of incentives were identified, which are 1) government schemes, 2) market schemes, (including sector-oriented schemes and consumer-oriented schemes) and 3) community-based schemes. They provide voluntary incentives for AF adoption by farmers (Segerson 2013), and their labels reflect their financing source as shown in Table 1.

Table 1: Output of brainstorm sessions, i.e. schemes/mechanisms that could provide economic incentives to farmers to adopt agroforestry.

	Government	Market		Community
		Sector-oriented	Consumer-oriented	
Type	Payment for Ecosystem Services/Agri-environment schemes e.g. AF investment subsidy e.g. AF maintenance subsidy Land incentives e.g. prioritizing public land for agroecology Greening measures e.g. ecological surface area Tax incentives	Payment for Ecosystem services/Emission trading schemes: e.g. carbon markets e.g. water quality trading e.g. biodiversity offsets Funds and trusts e.g. green seats of airline companies Insurance discounts e.g. smaller premiums for more resilient systems Interest-free loans e.g. for investing in AF	Standards and certification: e.g. carbon label e.g. animal welfare/quality label e.g. woodland eggs, e.g. pata negra ham Agritourism/ Direct marketing: e.g. farm shops e.g. farmers' markets e.g. vegetable/food boxes Niche and specialty markets e.g. buckthorn, e.g. nuts	Shared ownership with consumer: e.g. community supported agriculture e.g. Pomona cooperative AF business e.g. 'adopt a tree' Shared ownership with forester/investor e.g. annual compensation for maintenance of trees Local currency e.g. which can be used for local services
Financing source	Public	Private (companies, NGO's, banks, etc.)	Consumers	Community/ Cooperative
Participation incentives	Incentive payments (/regulatory threats)	Incentive payments	Consumer demand	Benefits from cooperation

Government schemes include all approaches that are financed by the government, i.e. with public money. The most traditional arrangement in this category is an AF subsidy program, by analogy with other agri-environment schemes. This idea was brought up in all focus groups, and was considered easy to set-up by the participants. In Flanders, such an AF subsidy program already exists since 2011, which is funded for 50% by the European Agricultural Fund for Rural Development (under Pillar II of the CAP), and covers up to 80% of the investment costs. Until 2017 54 plots were planted making use of the subsidy program, resulting in about 100 ha of AF. Besides the subsidy for AF systems, also support exists for the establishment of hedgerows. This support, granted by VLIF (the Flemish Agricultural Investment Fund) covers up to 100% of costs, and is complemented with a maintenance subsidy granted by VLM (the Flemish Land Agency). Another, more innovative idea is a land incentive program, in which publicly owned farming land is prioritized for sustainable farming systems. This idea is inspired by conservation easement programmes in the US (Duke and Lynch 2007). The lessor of the land, e.g. provinces, municipalities or church administrations, lowers the rent charged to the farmer on the condition that agroecological farming systems are used on the land. In Flanders, where the pressure on land is high and access to land is difficult, this measure could generate strong incentives for farmers to change their production methods. The government could also impose sustainability conditions on farmers' practices and management approaches in exchange for financial support. This concerns, amongst others, the greening measures on arable land in the context of the Common Agricultural Policy (CAP), resulting in farmers losing some of their basic payments in the case of non-compliance. Currently the greening measures still give a lot of freedom to the farmer who can chose to implement any of the suggested measures to achieve 5% of Ecological Focus Area. However, this freedom results in AF systems being pushed into the background to the benefit of easier and more straightforward measures that are often already implemented by farmers, e.g. catch crops, nitrogen fixing crops and fallow (Zinngrebe et al. 2017). Also the fact that AF on permanent grassland and AF plots that were not installed making use of the subsidy program (or were not officially registered as AF under the same stringent conditions), are not eligible as greening area, put AF as a greening measure at a disadvantage. Another government measure, which could increase the uptake of AF systems more directly, are tree density-based taxes. However, such a stringent measure that punishes farmers for having no trees on their farm could result in a lot of resistance from the agricultural

sector. In this respect, voluntary approaches are considered by the respondents as more appropriate and effective.

Market schemes include inventive market mechanisms, or use new market channels to reward farmers for value creation through AF practices. Based on the financing source, they can be split up in sector- and consumer-oriented schemes. *Sector-oriented schemes* include all arrangements in which private actors like companies, organizations, banks and NGO's incentivize farmers to plant trees on their land. This includes ecosystem trading, an arrangement implying financial transfers between companies as causers, and farmers as mitigators of environmental pollution. Carbon markets, in particular, could provide incentives for AF systems because of the large potential of trees to store carbon and mitigate climate change. The government could oblige companies to participate in these markets by issuing compulsory tradable permits (Holderieath et al. 2012). However, respondents argued that, given the high negotiation and enforcement costs involved, in the short term, the establishment of voluntary funds and trusts for tree plantation on farmland might be more effective. An example of the latter are green surcharges of airline companies, through which they allow passengers to compensate for the generated carbon emissions. Respondents also thought that banks have a role to play by offering interest-free loans to farmers to invest in agroecological farming systems, whereas insurance companies could lower insurance premiums for robust and resilient farming systems. Indeed, many studies prove the resistance of agroecological systems against extreme climatic events (Altieri and Nicholls 2013), which is becoming increasingly important because of climate change. *Consumer-oriented schemes* are a group of marketing approaches that persuade the consumer to pay a correct price for an added-value product. In the case of AF systems this added value is the wide range of ecosystem services generated throughout the production process. Labels, which attract consumers' attention on a product's special attributes, belong to this group of approaches. In some EU countries these labels already exist, e.g. woodland eggs in the UK or 'pata negra' ham in Spain, reflecting especially animal welfare and quality aspects. Also direct marketing approaches that bridge the gap between producers and consumers are considered valuable, and a way to transfer the extra production costs directly from consumer to producer. In this respect, because of its landscape value, AF systems may be boosted especially by farm shops, which imply consumers passing by and stopping over at the farm. Finally, respondents emphasized the importance of the development of special markets for niche and specialty products, such as developing market outlets for e.g. buckthorn berries. The same is true for products which are not new, but for which no formal value chains exist yet in Flanders, as is the case for different kinds of nuts.

Community-based schemes bundle a range of initiatives that imply the formation of a cooperative structure that will finance or invest in AF systems. The ownership of the AF system is then shared between the different people involved in the cooperative. The best known example of such a structure, that considers also consumers as shareholders of the farm, is community-supported agriculture (CSA). Although often fruit trees are planted on a CSA farm, they are not assigned a central role. However, recently in Flanders a new CSA farm, Pomona vzw (Figure 1), was developed that will specialize in AF systems (Bauwens et al. 2018). The name of the cooperation refers to the Roman goddess of plenty, of fruit trees and orchards, which was chosen to draw attention to agroforestry as a regenerative and restorative farming system. Consumers commit themselves to purchase food products from the cooperation by becoming shareholders. In exchange the farmers of the cooperation commit themselves to the production of a broad range of food products through agroforestry or other forms of restoration agriculture, with respect for mankind, animals and the environment. Less binding agreements could also exist, in which families adopt a fruit tree and later on are allowed to harvest the fruits. A cooperative agreement can also be arranged between a farmer, and a forester or an investor, who takes care of tree management or annually compensates the farmer for the labor involved. To further stimulate local value generation, local currency systems could be thought out, in which the products of the AF can be traded off against local services. These ideas however are rather outside the box, and need careful planning before they can be implemented in practice.

Figure 1: Logo and banner of Pomona, an agroforestry cooperation that was recently established in Flanders

Conclusion

During the focus groups a wide range of financial incentive mechanisms were identified that could advance the uptake of AF systems by farmers. These arrangements can be clustered according to their main financing source, being (1) the government, (2) the market or (3) the community. Despite this wide range of ideas, currently only some government mechanisms, i.e. the subsidy program and greening measures, are put in place. The other mechanisms, although targeting different types of AF and representing great opportunities to involve different actors, are not yet (fully) exploited. However, different incentive mechanisms could co-exist and reinforce each other. Further development and tailoring of these different economic pathways can therefore help to turn AF into a more solid economic investment for farmers.

References

Altieri MA, Nicholls CI (2013) The adaptation and mitigation potential of traditional agriculture in a changing climate. Clim Change 1–13.

Bauwens L, De Roeck T, Temmermans M, Van Gasse B, Van Hoye A, Van Hoye I (2018) Pomona vzw [WWW Document]. URL http://www.pomonacoop.be/ (accessed 04/03/2018).

Borremans L, Reubens B, Van Gils B, Baeyens D, Vandevelde C, Wauters E (2016a) A Sociopsychological Analysis of Agroforestry Adoption in Flanders: Understanding the Discrepancy between Conceptual Opportunities and Actual Implementation. Agroecol Sustain Food Syst 40: 1008–1036.

Borremans L, Reubens B, Wauters E (2016b) Nurturing agroforestry systems in Flanders: an Agricultural Innovation System approach. 3rd European Agroforestry Conference, Montpellier, France.

Borremans L, Marchand F, Visser M, Wauters E (2018) Nurturing agroforestry systems in Flanders: Analysis from an agricultural innovation systems perspective. Agric Syst 162: 205–219.

Duke JM, Lynch L (2007) Gauging support for innovative farmland preservation techniques. Policy Sci 40: 123–155.

Heslin PA (2009) Better than brainstorming? Potential contextual boundary conditions to brainwriting for idea generation in organizations. J Occup Organ Psychol 82: 129–145.

Holderieath J, Valdivia C, Godsey L, Barbieri C (2012) The potential for carbon offset trading to provide added incentive to adopt silvopasture and alley cropping in Missouri. Agrofor Syst 86: 345–353.

Palma J, Graves AR, Burgess PJ, van der Werf W, Herzog F (2007) Integrating environmental and economic performance to assess modern silvoarable agroforestry in Europe. Ecol Econ 63: 759–767.

Segerson K (2013) When Is Reliance on Voluntary Approaches in Agriculture Likely to Be Effective? Appl Econ Perspect Policy 35: 565–592.

Smith J, Pearce BD, Wolfe MS (2012) Reconciling productivity with protection of the environment: Is temperate agroforestry the answer? Renew. Agric Food Syst 28: 1–13.

Van Vooren L, Reubens B, Broekx S, Pardon P, Reheul D, Van Winsen F, Verheyen K, Erwin W, Ludwig L (2016) Greening and producing: an economic assessment framework for integrating trees in cropping systems. Agric Syst 148: 44–57.

Wodehouse A, Ion W (2012) Augmenting the 6-3-5 method with design information. Res Eng Des 23: 5–15.

Zinngrebe Y, Pe'er G, Schueler S, Schmitt J, Schmidt J, Lakner S (2017) The EU's ecological focus areas – How experts explain farmers' choices in Germany. Land Use Policy 65: 93–108.